Castilleja linariifolia

Castilleja

Publication of the Wyoming Native Plant Society

Mar 2023, Volume 42(1)

Posted at www.wynps.org

Above: *Hymenoxys grandiflora*, by Susan Marsh. April is a time filled with preparation for the growing season also marking a new state proclamation.

April is Wyoming Native Plant Month

We are proud to announce that April is **Wyoming Native Plant Month**! In the midst of the legislative session, Governor Mark Gordon signed a proclamation to recognize April 2023 as Wyoming Native Plant Month. This proclamation encourages everyone in Wyoming to recognize and celebrate the importance of native plants to its people and wildlife. It further encourages citizens to plant native trees and flowers in their yards, remove non-native invasive plants from their communities, and educate themselves about the many benefits of native plants.

Look for press releases! We welcome hearing about any local native plant happenings in Wyoming communities that might be highlighted.

In this Issue:

April is Wyoming Native Plant Month 1
Why is Desert yellowhead so rare? 1,7,8
2023 Wyoming Wildflower Weekend,
Annual Meeting and Registration 3-6
Ethnobotany – *Artemisia ludoviciana*..... 9
Whitebark pine is designated Threatened ...10

Why is Desert Yellowhead (*Yermo xanthocephalus*) so rare?

By Bridger Huhn

Wyoming is home to about 3,000 different plant species (www.wyomingbiodiversity.org), many of which also reside in surrounding states. However, there are over 30 plant species and varieties that grow nowhere else in the world but Wyoming (Heidel, 2019). When a plant species' distribution is restricted to a specific area it is considered to be "endemic" to that region – so in this case, the Desert Yellowhead is a Wyoming endemic.

Emerging research suggests that endemic plants are important for maintaining healthy ecosystems (Panista 2021), but we have yet to discover why these plants occupy such small distinct habitats. Many narrow endemic plants are found to have stress tolerant traits (Médail & Verlague, 1997; Casazza et al., 2005; Behoozian et al., 2020), and occur in stressful environments with low competition (Médail & Verlaque 1997; Trigas et al. 2008). Their stressful environments can be limited by water, nutrients, or instability.

My research, which was funded by the WYNPS, tests this prediction on a very charismatic endemic: desert yellowhead (*Yermo xanthoxcephalus*). Among the base of eroded hills near the divide between the Sweetwater Valley and the Wind River basin grows this seemingly out of place member of the aster family (Figure 1).

(Continued p. 7)

WYNPS News

Plan Ahead!: All registration and event information for the 2023 WYNPS Annual Meeting/ Wildflower Weekend, from **June 16-18**, is in this issue. We will gather in Clark, WY, at the foothills of the Beartooth Mountains. Please consider sending in the registration form while you're thinking about it. You may also register online.

WYNPS Board – 2023
President: Kristy Smith, Driggs, ID (smith.kristy217@gmail.com)
Vice-President: Joyce Evans (iroxranch@yahoo.com)
Sec.-Treasurer: Dorothy Tuthill, Laramie (dtuthill@uwyo.edu)
Board-at-large: Heidi Anderson, Gardiner, MT (heidi_anderson@nps.gov) (2023-'24)
Greg Pappas, Laramie (gregory.pappas@usda.gov) (2022-'23)

Other Contacts:
Editor: Bonnie Heidel (bheidel@uwyo.edu)
Webmaster: vacant
Sublette Chapter: Jill Randall, President (possum1b@yahoo.com)
Teton Plants: Amy Taylor, Treasurer; (tetonplants@gmail.com). Check the chapter homepage (https://tetonplants.org/) for events.

Teton Plants is teaming with Bird and Nature Club to feature nature programs every second Tuesday of the month through winter thanks to the co-sponsorship with the Teton County Library. There will be hybrid zoom/live programs. Check out the schedule at the Teton Plants homepage (above).

General questions: wynps@wynps.org

Social Media: We are on Facebook as Wyoming Native Plant Society and Instagram as @wyomingnativeplantsociety. Follow us on either platform for WYNPS updates and native plant content.

2023 Renewal – It's not too late: You can still renew by filling out and mailing the renewal insert (see December issue), or the small form at the back of this issue, *or* online via PayPal (www.wynps.org).

Treasurer's Report: Balance as of 9 Feb: Scholarship = $2,158; General = $9,310.49; Total = $12,068.49

New members: Please welcome the following new members to WYNPS: Paul Allen, Pocatello, ID; Marcell Astle, Rawlins; Jessica Cherni, Parkman; Jaclyne Harkink, Worland; Laney Hicks, Crowheart; Christopher Hiemstra, Fruit Heights, UT; Jennie Lawrence, Laramie; Angela Leone, Worland; Douglas Reynolds, Red Lodge, MT; Thera Ringhofer; Elaine Sawyer, Swan Valley, ID.

Message from the Editor:

March is a month of anticipation no matter what Wyoming winds bring of blasts or breezes. This issue brings extra reason for eagerness thanks to the Board working with the Governor's Office, in partnership with Garden Club of America, to recognize April as Wyoming Wildflower Month.

It also offers up the exciting agenda of the 2023 Annual Meeting/ Wildflower Weekend. We will converge on Clark, Wyoming, in the shadow of the Beartooth Mountains, for amazing hikes, workshops and presentations, in collaboration with the Buffalo Bill Center of the West.

~Bonnie Heidel

Next issue: Please send articles and announcements for the next newsletter by 15 April to:

Wyoming Native Plant Society
P.O. Box 2449
Laramie, WY 82073

Contributors to this Issue: Bonnie Heidel, Bridger Huhn, Kathy Lichtendahl, Meredith Taylor and Dorothy Tuthill.

Wyoming Native Plant Society
Wildflower Weekend

Come to Clark, June 16-18, for a wonderful slate of workshops late Friday and hikes on Saturday and Sunday! Hike options offer stunning wildflowers displays from Beartooth foothills to mountains. This event is open to the public. Membership in the Society is not necessary, but registration is required to attend – see the registration on p. 6.

Location: We reserved the Clark Pioneer Recreation Center (CPRC); 321 Road 1AB, Clark, WY. All events start there unless otherwise noted. This information is also available on our homepage (www.wynps.org).

Schedule at a Glance

Friday, June 16

3pm - 5pm On-site registration, silent auction bidding opens
4pm - 6pm Top 6 Wyoming Plant Families
6pm - 7pm Dinner on your own
7pm - 9pm Artist's Round Robin workshops

Saturday, June 17

8:00am - 8:30am On-site registration
8:30 am - 4pm All field trips start at CPRC

- Swamp Lake
- Beartooth Front
- Bald Ridge
- Heart Mountain

6pm - 7pm Pizza dinner
7pm - 8pm Plant diversity and evolution in the paintbrushes *(Castilleja);* David Tank, Director, Rocky Mountain Herbarium, University of Wyoming (keynote speaker)
8pm Silent auction winners announced

Sunday, June 18

7:00am - 8:00am Annual meeting with continental breakfast
Half-day field trips

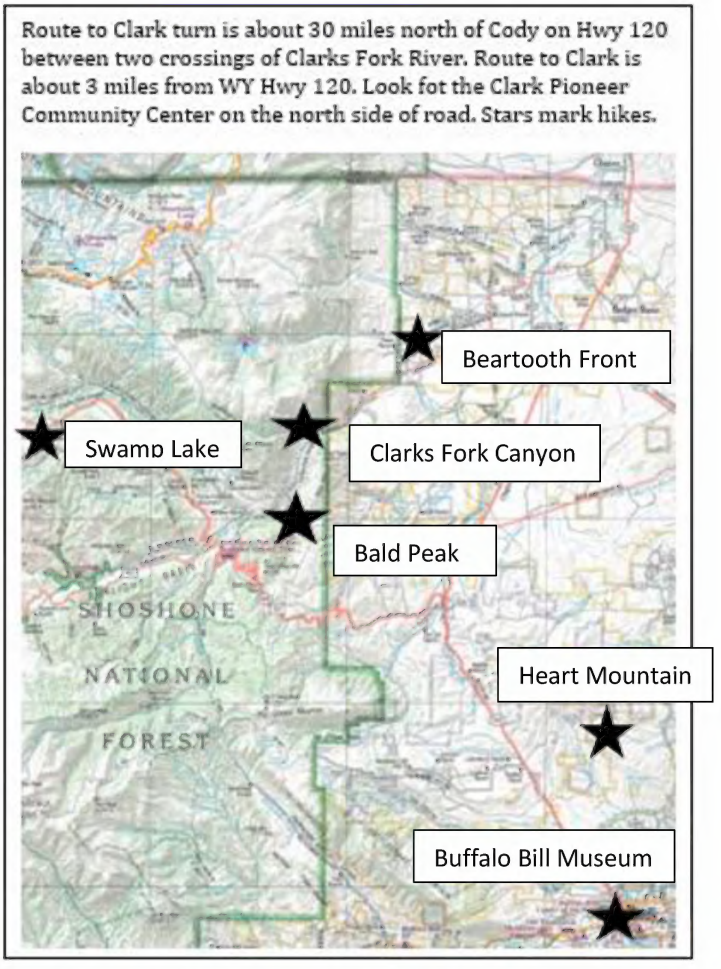
- 8am - 12 Clark's Fork Canyon - meet at CPRC
- 9am- 12 Wildflower Watch - meet at Buffalo Bill Center of the West, Cody

Camping and Hotels: Primitive sites for tent camping are available at the Clark Pioneer Recreation Center, with use of the Center for restrooms, water and kitchen facilities, for a fee of $10/night (see registration). Plug-in campsites are available nearby at Edelweiss Riverhouse and there are local B&B options.

Food: Use of CPRC facilities is available for meals on your own (Friday dinner and Saturday breakfast). Bring your own lunch on Saturday hikes. Join us Saturday for dinner with a selection of pizzas and with salad (see registration). A continental breakfast will be available at the Sunday Business Meeting.

Other Information: No dogs on any hikes. Please make sure to arrive at hikes with shoes clean of mud and weed seeds so we don't accidentally introduce weeds. Carpooling is recommended.

Questions? Please contact us via email at www@wynps.org .


Route to Clark turn is about 30 miles north of Cody on Hwy 120 between two crossings of Clarks Fork River. Route to Clark is about 3 miles from WY Hwy 120. Look fot the Clark Pioneer Community Center on the north side of road. Stars mark hikes.
Beartooth Front
Swamp Lake
Clarks Fork Canyon
Bald Peak
SHOSHONE
NATIONAL
FOREST
Heart Mountain
Buffalo Bill Museum

DETAILED SCHEDULE

FRIDAY – registration at 3-5 pm, CPRC in Clark
4-6 pm Fun Learning Plant Families – Check out the new brochure on the "Top Six Plant Families of Wyoming" and join Rocky Mountain Herbarium staff for a sneak peek at some of what's blooming.
7-9 pm Artist's Round Robin - Attendees will have the opportunity to learn from four artists about their unique specialties in this round robin style workshop which allows participants to switch instructors every half hour. Bring along a kneeling pad or camp chair as we will gather outdoors, weather permitting.

Kassy Skeen is the Ecologist for the Shoshone National Forest. Come join her for an artist's workshop covering ethics of plant collecting on public lands and pressed plant art. We'll provide examples, some pressed materials, and cardstock. Bring a mini press if you've got one, and a creative spirit.

Dorothy Tuthill will share some simple techniques for documenting plants in a nature journal. Careful observation accompanied with note-taking and sketching is a great way to get to know (and remember!) plants. Plus it's fun! We'll provide pencils and paper, but bring a handlens, journal, and journaling supplies if you have them.

Leslie Tribble is a writer and naturalist wandering the sagebrush of Wyoming. She'll talk about the essence of nature writing and you'll have the chance to pen your own poem or two. Supplies will be provided or you can use your own journals. Bring your thoughts, words and emotions for this session.

Kathy Lichtendahl is a professional conservation photographer who specializes in photographing tiny creatures and the plants they inhabit. She will discuss the finer points of macro photography and demonstrate some tools and techniques to help you get the image you want. Bring your cameras, whether they be DSLRs or cell phones.

SATURDAY - registration at 7:30-8:30 am
All-day hikes leave from CPRC @ 8:30 am.

Bald Peak Hike

Hiking Distance: 3 miles round trip
Elevation change: app. 1000 ft (7600-8600 ft)
Difficulty: Moderate, faint trail not maintained

Hike along Bald Ridge with overviews of the upper Clarks Fork canyon valley and the Big Horn Basin. Proceeding to the highpoint at Bald Peak, the views only get better! Regional endemics should be in bloom - Shoshonea, Howard's forget-me-not, Jone's columbine. Hike leader is Kent Houston (Shoshone NF, ret.) and with the Geology expertise of both Henry Heasler and Cheryl Jaworowski.
Meet: Caravan from Clark (app. 25 mi one-way). This includes app. 11 miles on the Chief Joseph Hwy where we will go to a paved pull-off app. 1/4 mile past the Forest Road 100 to re-assemble and ride share to the start of the hike.
Required: The Bald Ridge road requires high clearance 4 wheel drive. Bring bear spray and good hiking boots, as well as lunch, and water.

NOTE: There are no gas stations in Clark. The nearest ones are in Cody over 30 miles away.

Beartooth Front Hike

Difficulty: moderately difficult
Distance: 5 miles round trip
Elevation change: Approximately 1,200'

Join landowner Kathy Lichtendahl for a hike on her property along the front range of the Beartooth Mountains. Bordering Shoshone National Forest to the west and BLM on all other sides, this relatively untouched landscape provides a much needed buffer for wintering wildlife between the steeply rising mountains and the growing community of Clark. The hike will start amid the yucca and prickly pear at 4,800' and climb for 2.5 miles to approximately 6,000' in search of Alpine forget-me-not and bitterroot before retracing our steps.
Required: Hiking footwear (NO open toed shoes), adequate water for a day in the field
Recommended: Long pants, long sleeved shirt, sunscreen, large brimmed hat, sack lunch and/or snacks, hiking pole(s), pad for sitting/kneeling
Optional: Bear spray, camera, note pad and pencil

Swamp Lake Hike

Difficulty: Easy to Moderate
Distance: 1- 2 miles
Elevation change: Less than 400', through swampy conditions
Immerse yourself in the richness of the Swamp Lake Botanical Area on the Shoshone National

Forest, and the stunning Clark's Fork Valley. Kassy Skeen, USFS Ecologist and Bonnie Heidel, WYNND Botanist will take you on a tour of discovery highlighting a bounty of rare plants found in Wyoming's largest fen. The hike will start at water's edge stalking some of the 19 Wyoming Species of Concern that grow here. We may also hike uphill slightly to gain an overview perspective from above.
Meet: Caravan from Clark (app 50 mi one-way).
Required: Ditch boots (or old tennis shoes; we will be getting our feet very wet), water and lunch
Recommended: Long pants, long sleeved shirt, sunscreen, bugspray (mosquitoes may be plentiful), hat, bear spray
Optional: Camera, note pad and pencil

Heart Mountain Hike

Difficulty: strenuous
Distance: 8 miles
Elevation change: 2500 ft.

Join us as we explore the geologic and botanical hotspot of The Nature Conservancy's Heart Mountain Ranch. With its unusual limestone cap, Heart Mountain is a geologic puzzle, where older limestone lies atop younger strata. Heart Mountain supports one of the greatest concentrations of rare plants on private lands in Wyoming. Of particular interest are several cushion plant communities found on cliffs near its summit. We are likely to find *Shoshonea pulvinata*, *Kelseya uniflora*, and many others. The hike will start at the base of the mountain in diverse sagebrush steppe, with a hike to the summit.
Meet: We will caravan from Clark at 8:30am.
Note: Bring lots of water, lunch/snacks, clothing in case of changing weather, bear spray if you have it.

6pm - 7pm Pizza dinner (get your reservation!
7pm - 8pm Plant diversity and evolution in the paintbrushes *(Castilleja);* David Tank, Director, Rocky Mountain Herbarium, University of Wyoming (keynote speaker)
8pm Silent auction winners announced
SUNDAY – annual meeting at 7-8 am
Half-day hikes start 8 am at CPRC; at 9 am in Cody

Clarks Fork Canyon Hike

Difficulty: easy - moderate
Distance: TBD based on group interest (2-5 miles)
Elevation change: minimal

The Clarks Fork Canyon tells a dramatic geological story of change, both ancient and contemporary. Local resident Kathy Lichtendahl will lead this hike in the company of geologists Henry Heasler and Cheryl Jaworowski. Participants will have a chance to examine the plant life along the trail in light of massive changes to the landscape brought about by last year's severe flooding of the Clarks Fork River.
Meet: Participants will meet @ 8 am at the CPRC and caravan to the canyon just 5 miles west.
Recommended: Hiking footwear, water, long pants, long sleeved shirt, sunscreen, large brimmed hat, sack lunch and/or snacks, hiking pole(s), pad for sitting/kneeling
Optional: Bear spray, camera, note pad and pencil

Wildflower Watch Hike, Buffalo Bill Center, Cody

Difficulty: easy
Distance: 1.25 miles
Elevation change: minimal

Take a short hike on the designated trail near the Buffalo Bill Center for an opportunity to collect data for this citizen science project. After the hike, a behind-the-scenes tour of the Draper Natural History Museum Laboratory will visit the herbarium representing plants of surrounding mountains, with ~ 5000 duplicate specimens from the Rocky Mountain Herbarium and the personal collection of Erwin Evert. Participants will learn how and why natural history museums play a pivotal role in the preservation of biodiversity.
Meet: Participants will meet @ 9 am at the front door of the Buffalo Bill Center of the West in Cody. They will be joined by employees and volunteers of the Center for a description of the Wildflower Watch Program.
Note: It takes less than an hour to travel between Clark and Cody.
Recommended: Hiking footwear.

2023 WYNPS Annual Meeting Registration Form

Please register by June 10 by mail or online. On-site registration will be available for activities other than Saturday dinner but advance registration for all events is encouraged and appreciated.

Registration fee[1] for the weekend is $15/person. Children 12 and younger are free.

Name(s) _____ Email _____

Address_____

Number in party: Adults _____ Children 12 and under_____

Saturday evening dinner cost is $10/person, including children under the age of 12

Dinner will consist of a selection of pizzas along with salad. Please indicate your preference with a check mark. If there are additional people in your party, include the number in front of each option.

TOPPING ____Meat or ____Vegetarian CRUST ____ Gluten-free or ____Wheat

Tent Camping fee is $10 per tent/night.

Primitive tent camping is available at the Clark Pioneer Recreation Center. Check the nights you plan to camp on site: _____Friday _____Saturday

FEES

Registration @ $15/person Number of people_____ Total registration fee _____

Saturday Dinner @ $10/person Number of people_____ Total meal cost _____

On-site Camping @$10/tent/night Number of nights _____ Total camping fees _____

TOTAL FEES _____

Please mail form and check to Wyoming Native Plant Society, P.O. Box 2449, Laramie, WY 82073.
You may also register online via PayPal (www.wynpw.org). Send registration FOR RECEIPT BY JUNE 10.

Please check the events you plan to attend on Friday, Saturday and Sunday. Note that only one hike may be selected for each of Saturday and Sunday due to overlapping times. If there are additional people in your party, indicate the number by each event.

Friday
4pm Plant Families workshop___
7pm Artist's Round Robin _____

Saturday 8:30am-4pm all-day
Swamp Lake_____
Beartooth Front_____
Bald Ridge _____
Heart Mountain _____

Sunday half-day hikes
8am Clark's Fork Canyon_____
9am Wildflower Watch _____

Why is Desert Yellowhead rare?

Cont. from p. 1

Figure 1: Desert Yellowhead grows in a barren wash in central Wyoming. By B. Huhn

Although many of the plants accompanying the yellowhead are what you would expect in the desolate landscape (small scrubby shrubs or cushion plants), the yellowhead can have leaves that top 25cm long and 6cm wide! The desert yellowhead has only been found in two populations. One population grows on the bases of the mesa shaped hills in sparsely vegetated washes, while the other grows on a rocky hillside with higher densities of surrounding plants (Heidel et al. 2011).

My prediction is that endemic plants are rare because they are specialized to thrive in small stressful environments. But how do we measure if an environment is stressful? After all, a desert would be stressful for a plant like the rocky mountain iris but not so for a plant like the plains' prickly pear cactus. To address this, my research examines an endemic plant in comparison to its more common neighbors. The idea being that if it is a stressful habitat, common plants will be stressed in that endemic habitat, but the endemic plant will be doing fine.

To test whether this plant is a specialist to this harsh environment I chose to look at how the desert yellowhead is able to use sunlight to make sugars using photosynthesis. When light hits a leaf, it sets off a series of reactions that make sugars for the plant to use for energy, but not all of the light that hits the leaf gets used. Some of the light is converted into heat, and some of it is lost making the leaf glow in wavelengths of light that our eyes cannot see. If you are a plant, you want to use as much of the light as possible, but it impossible to use it all. Plants that are less stressed are able to use more light than those that are stressed.

To measure how much light a plant is able to use, I have an instrument that closes over the plant's leaf and measures just the proportion of light that is used for photosynthesis over a range of light levels. By using different light levels representing the amount of light from full darkness to full sunlight, we get the whole range of possible light conditions the plant is exposed to throughout the day. By comparing desert

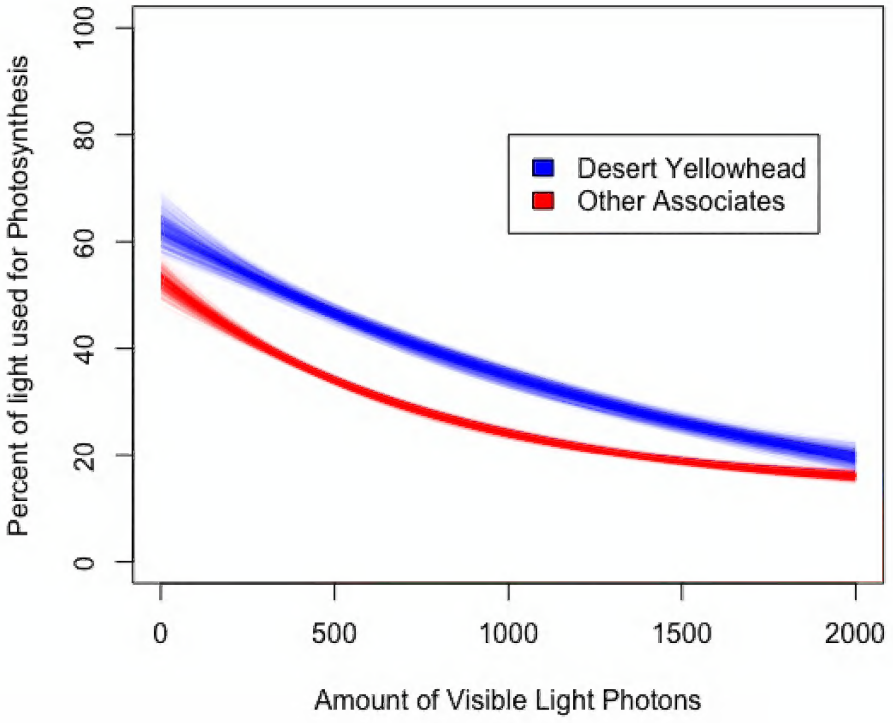


Figure 2: Desert Yellowhead uses a significantly higher proportion of the light that is used.

yellowhead to all of the plants around it, I found that it uses light more efficiently than its associates such as indian rice grass, and Wyoming big sagebrush (Figure 2). Using light more efficiently suggests that desert yellowhead is better suited to its environment than the more widespread plants that we found. The results of this research point to desert yellowhead being specialized to these harsh environments.

Literature cited

Behroozian, M., H. Ejtehadi, F. Memariani, S. Pierce, and M. Mesdaghi. 2020. Are Endemic Species Necessarily Ecological Specialists? *Scientific Reports* 10, no. 1 (July 16, 2020): 11774. https://doi.org/10.1038/s41598-020-68618-7.

Casazza, G., G. Barberis, and L. Minuto. Ecological Characteristics and Rarity of Endemic Plants of the Italian Maritime Alps. *Biological Conservation* 123, no. 3 (June 1, 2005): 361–71. https://doi.org/10.1016/j.biocon.2004.12.005.

Heidel, B., J. Handley and M. Andersen. 2011. Distribution and habitat requirements of *Yermo xanthocephalus* (Desert yellowhead), Fremont County, Wyoming. For Bureau of Land Management by Wyoming Natural Diversity Database, Laramie, WY.

Heidel, B. 2019. Cowboy State Endemics: 36 renditions of resilience. Castilleja 38(4): 1, 8-9.

Médail, Frédéric, and Régine Verlaque. Ecological Characteristics and Rarity of Endemic Plants from Southeast France and Corsica: Implications for Biodiversity Conservation." *Biological Conservation* 80(3) (June 1, 1997): 269–81. https://doi.org/10.1016/S0006-3207(96)00055-9.

Panitsa, Maria, Ioannis P. Kokkoris, Konstantinos Kougioumoutzis, Anna Kontopanou, Ioannis Bazos, Arne Strid, and Panayotis Dimopoulos. Linking Taxonomic, Phylogenetic and Functional Plant Diversity with Ecosystem Services of Cliffs and Screes in Greece. *Plants* 10, no. 5 (May 2021): 992. https://doi.org/10.3390/plants10050992.

Trigas, P., Iatrou, G., & Panitsa, M. (2008). Vascular plant species diversity, biogeography and vulnerability in the Aegean islands as exemplified by Evvia island (W Aegean, Greece). *Fresenius Environmental Bulletin*, *17*(1), 48.

Ethnobotany - Part 5. ***Artemisia ludoviciana***
By Meredith Taylor, Certified Wyoming Naturalist

Artemisia ludoviciana By: Doug Goldman. Provided by USDA NRCS National Plants Data Team (NPDT). United States, Colorado, Larimer Co.,

Artemisia is a large and diverse genus, with more than 40 taxa (species, subspecies or varieties) just in Wyoming. Plant forms range from large shrubs (including our state shrub, Wyoming big sagebrush, *Artemisia tridentata* var. *wyomingensis*), to small herbaceous forbs. Most species have a strong aroma due to the presence of terpenoides and sesquiterpines, which are presumably there to reduce herbivory, but also make the species of interest to humans for a variety of purposes.

Plant description- *Artemisia ludoviciana,* also known by white sage, white sagebrush, silver wormwood, western mugwort and other names, is a perennial plant of the *Asteraceae* family. Native to North America, it is found in dry and semi-arid habitats. The herbaceous stems grow 0.3-1 m (1-3 ft) and bear silvery-white, linear leaves and an apical inflorescence. Like all members of the aster family, flowers are produced in compact heads that are surrounded by bracts. White sage's flower heads consist only of small yellow disk flowers (no rays), and the entire head is 3-5 mm (0.1-0.2 in) wide. Like the majority of Artemisias, this one relies on the wind to pollinate its very non-showy flowers. *A. ludoviciana* also spreads rapidly via rhizomes to produce colonies.

Artemisia ludoviciana has many ethnobotanical uses as a tea for digestive problems, laxative, deodorant, eczema and to stimulate childbirth. White sage was considered sacred to use as a smudge among Native Americans to cleanse and purify the body and general area, both spiritually in ceremonies and medicinally. The aromatic volatile organic compounds are important for respiratory treatment. A decoction is used for clearing the sinuses and soothing a sore throat and headache. It was also used topically to treat skin rashes, itching and sores. As a ceremonial herb, white sage was chewed in the sweat lodge to relieve thirst and also wipe away the sweat to cleanse the body, since water was taboo there. In addition, it was used to cleanse the border of the lodge to purify it for the sweat ceremony.

Many *Artemisia* species offer medicinal values that are used to treat worms, colds, fevers and headaches. Native Americans used select sagebrush species for many purposes, eg: edible leaves and seeds were ground to eat as flour. *A.. dracunculus* (tarragon) is used as a culinary herb.

Artemisinin is a sesquiterpine that has been extracted from *Artemisia annua* (sweet wormwood), a species native to Asia. It, in combination with synthetic derivatives, was used medicinally by Dr. Tu Youyou to cure Lyme's Disease and Malaria for which she was awarded the Nobel Prize for Medicine in 2015. As a traditional medicine, *A. annua* was consumed, taken as tea or applied to wounds, headaches and toothaches. This author treated her husband with artemisinin to successfully cure Lyme's Disease after he developed the bulls-eye reaction from a deer tick bite. Artemisinin is likely found in many *Artemisia* species, and may account, in part, for their medicinal properties. *A. annua* has been introduced to North America; the Rocky Mountain Herbarium has recorded a single Wyoming collection, from a garden in Crook County.

References

Kershaw, Linda, Edible *and Medicinal Plants of the Rockies*, Lone Pine Publishing, 2000.

Moerman, Daniel E., *Native American Ethnobotany*, Timber Press, 2000.

USDA Plants Database, Posted at: https://plants.usda.gov/home

Wikipedia, https://en.wikipedia.org/wiki/Artemisinin

Check directly with the agency about their policy if you want to harvest native plants on public land.

Whitebark pine receives Endangered Species Act protection as a Threatened species

On December 15, 2022 the U.S. Fish and Wildlife Service determined that whitebark pine (*Pinus albicaulis*), a high-elevation tree species found across western North America, is a threatened species under the Endangered Species Act. It is a dominant and co-dominant species with is greatest extent in the Greater Yellowstone. Yet it was assessed that as of 2016, 51% of all standing trees across its range were dead and the species remains vulnerable white pine blister rust, a fungal disease caused by the nonnative pathogen *Cronartium ribicola*. They determined that it is also negatively affected by the mountain pine beetle (*Dendroctonus ponderosae*), altered fire regimes and the effects of climate change. The final rule and supporting information are posted at: https://www.federalregister.gov/documents/2022/12/15/2022-27087/endangered-and-threatened-wildlife-and-plants-threatened-species-status-with-section-4d-rule-for .

WYOMING NATIVE PLANT SOCIETY MEMBERSHIP FORM

Date _____

Name _____

Address _____

Email _____

Please check all appropriate boxes:

[ ] New member
[ ] Renewing member
[ ] Check here if this an address change
[ ] Annual membership with email notification of newsletters: $10
[ ] Annual membership with mailed newsletters: $12
[ ] Annual membership with scholarship support and email notification of newsletters: $20
[ ] Annual membership with scholarship support and mailed newsletters: $22
[ ] Life membership with email notification of newsletters: $300
[ ] Life membership with mailed newsletters: $300

In addition to the statewide organization, we have two chapters. Membership in chapters is optional; chapter members must also be members of the statewide organization.

[ ] Teton Plants Chapter annual membership: $5
[ ] Sublette Chapter annual membership: $5
[ ] Additional donation of $_____

Total enclosed: _____

Please write checks to **Wyoming Native Plant Society**

Wyoming Native Plant Society
P.O. Box 2449
Laramie, WY 82073